Babesiosis

1st Quarter 2011 DIDE Training

Jonah Long, MPH

West Virginia Bureau for Public Health
Your Health Your Safety Our Purpose
Department of Health & Human Resources

Objectives

- **Describe the epidemiologic characteristics of babesiosis**
- **Review the clinical symptoms, diagnosis, and treatment of babesiosis**
- **Explain how the babesiosis case definition is used to classify reported cases of babesiosis**

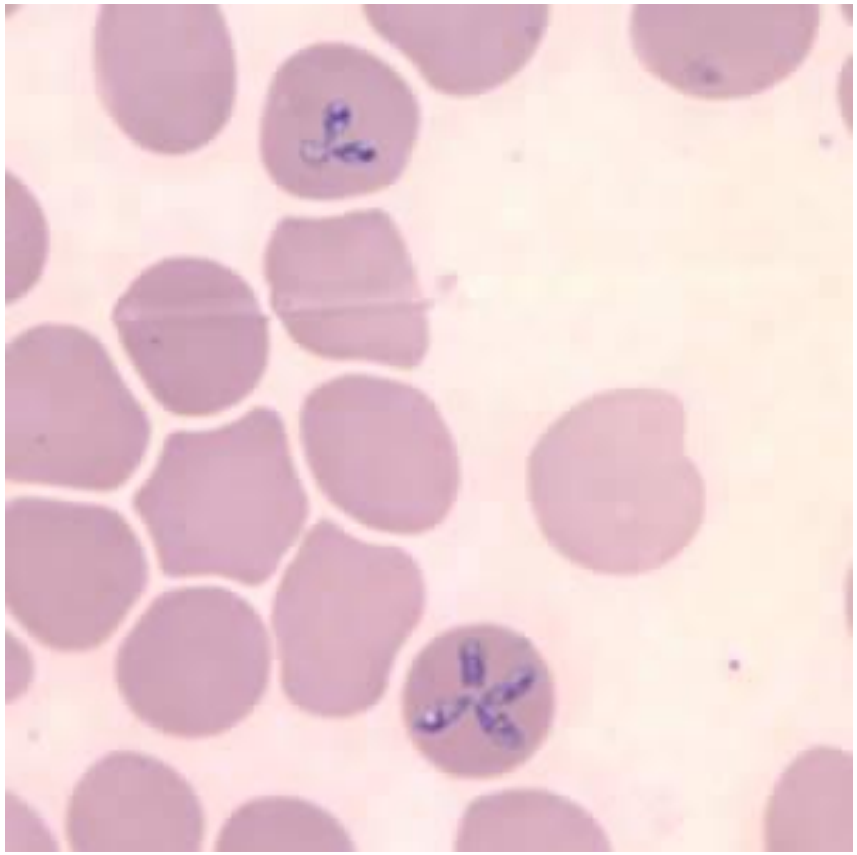
Epidemiology

- **Parasitic tick-borne infection**
  - **Agent: *Babesia* spp. (*B. microti*, *B. duncani*, *B. divergens*)**
  - **Vector: Blacklegged tick (*Ixodes scapularis*)**

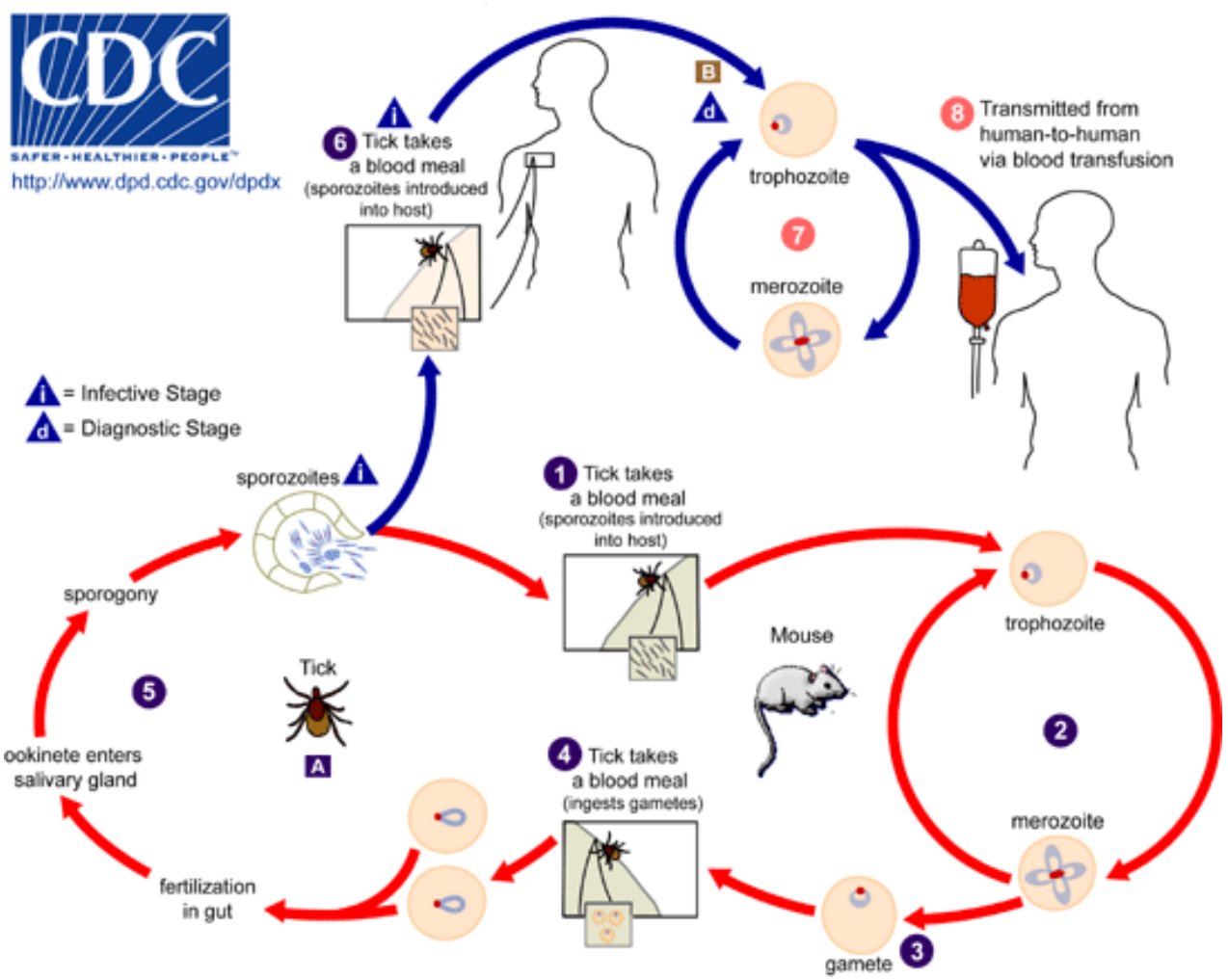
- **Endemic foci in U.S. suspected to be similar to Lyme disease**

- **Incubation period: varies based on mode of transmission**
  - **Tick-borne: 1-3 weeks**
  - **Blood-borne: weeks to months**

Babesia microti



Babesia spp. Life Cycle



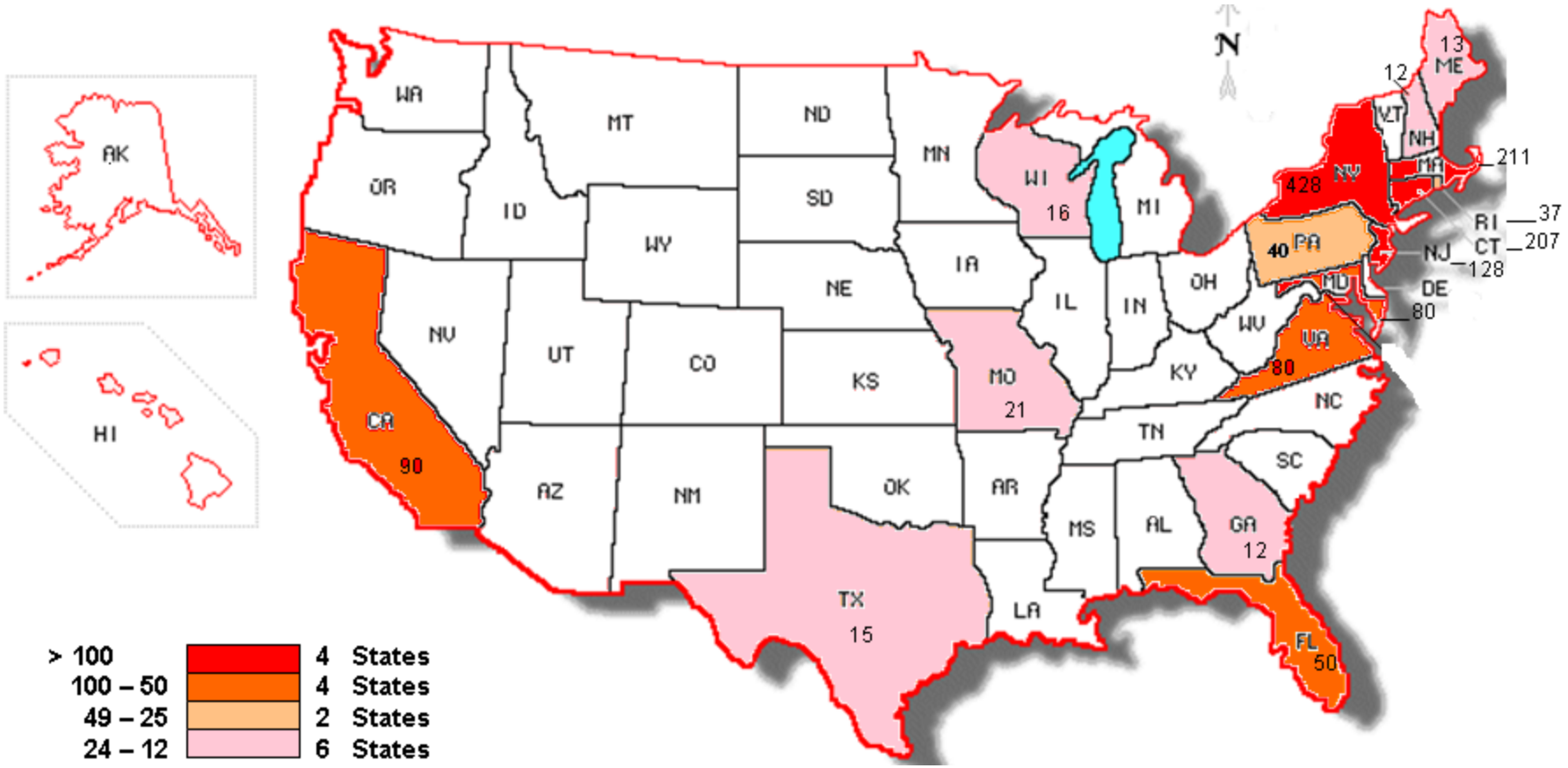
West Virginia Bureau for Public Health
Your Health Your Safety Our Purpose
Department of Health & Human Resources

Babesiosis Incidence

- **Not previously reportable, so data are limited**
  - **CT, RI, NY and MA have highest known incidence based on CMS claims data**
  - **In 2008, 43/50 states had CMS claims for babesiosis**

- **Limited data on seasonality and age distribution**
  - **Majority of treatment dates on CMS claims: July-August**

CMS Beneficiary Claims (Babesiosis) 2006–08



Note: states with fewer than 12 claims are represented in white

West Virginia Bureau for Public Health
Your Health Your Safety Our Purpose
Department of Health & Human Resources

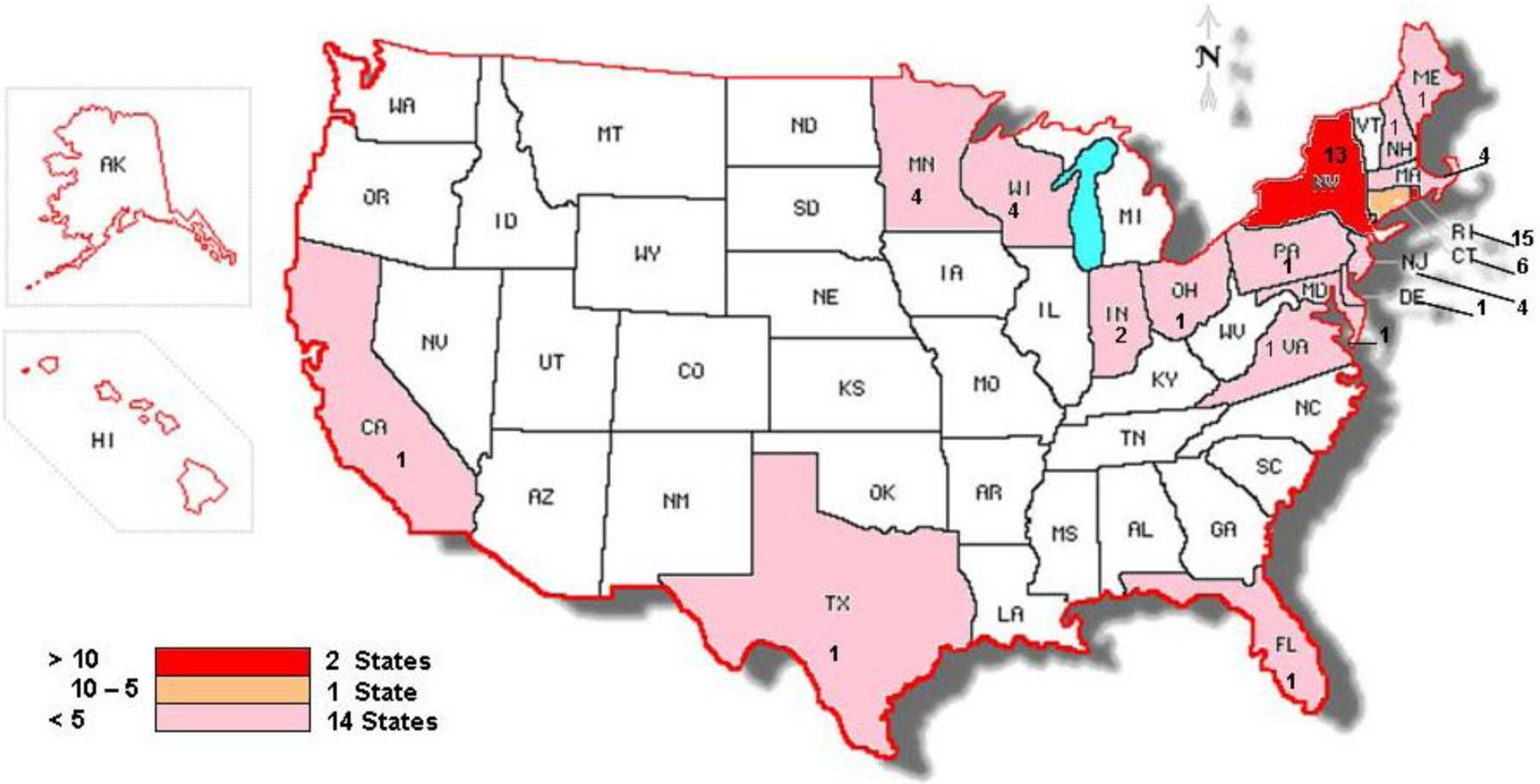
Transfusion-transmitted Babesiosis (TTB)

- ***Babesia*** **spp. can also be transmitted via blood products**

- **Over 100 cases of TTB documented since 1980**
  - **11 total deaths documented since 1998 (10 from 2006–2008)**

- **There is no licensed screening test available for detecting *Babesia* spp. in blood donors**
  - **Current strategy is donor deferral-based approach using a screening question**

TTB Distribution 2004–2008



Clinical Signs and Symptoms

- **Ranges from asymptomatic to severe infection**
  - **Seroprevalence surveys indicate asymptomatic infection common**
- **Fever, myalgias, sweats, fatigue, jaundice**
  - **Hemolytic anemia, thrombocytopenia, elevated liver enzymes**
  - **Several life-threatening complications**
- **Several host factors increase disease severity**

Diagnosis

- **Microscopy (gold standard)**
  - **Giemsa/Wright stain**
- **Molecular**
  - **Polymerase chain reaction (PCR)**
  - **Nucleic acid amplification (NAA)**
- **Serology**
  - **Indirect Fluorescent Antibody (IFA)**
    - ***Babesia* spp. IgG (or total Ig)**

Treatment

- **IDSA Guidelines (Published 2006)**
  - **http://cid.oxfordjournals.org/content/43/9/1089.full**
- **7–10 days of antibiotic treatment for active cases**
  - **Atovaquone + azithromycin OR**
  - **Clindamycin + quinine**
  - **Oral or IV depending on severity**
- **Severe cases may require blood transfusion**

Surveillance

- **Became nationally notifiable January 1, 2011**

- **Major components of case definition**
  - **Clinical**
  - **Laboratory**
  - **Epidemiologic link between blood product recipient and donor(s)**

Case Definition — Clinical

- **For the purposes of surveillance:**
  - **<u>Objective</u>: one or more of the following: fever, anemia, or thrombocytopenia**
  - **<u>Subjective</u>: one or more of the following: chills, sweats, headache, myalgia, or arthralgia**

Case Definition — Lab

- **Confirmatory:**
  - **Positive *Babesia* spp. via Giemsa stain (blood smear)**
  - **Positive *Babesia* spp. via PCR or NAA**
  - **Isolation of *Babesia* spp. via animal inoculation**
- **Supportive:**
  - **Positive *B. microti* IgG via IFA (titer ≥1:256)**
  - **Positive *B. microti* IgG via western blot**
  - **Positive *B. divergens* IgG via IFA (titer ≥1:256)**
  - **Positive *B. duncani* IgG via IFA (titer ≥1:512)**

Case Definition — Epi

- **For the purposes of surveillance, a donor-recipient epi link is defined as:**
  - **(a) In the transfusion recipient:**
    - **Received one or more RBC or platelet transfusions within one year before the collection date of a specimen with laboratory evidence of *Babesia* infection; and**
    - **At least one of these transfused blood components was donated by the donor; and**
    - **Transfusion-associated infection is considered at least as plausible as tickborne transmission; and …**

Case Definition — Epi

- **For the purposes of surveillance, a donor-recipient epi link is defined as (continued):**
  - **(b) In the blood donor:**
    - **Donated at least one of the RBC or platelet components that was transfused into the above recipient; and**
    - **The plausibility that this blood component was the source of infection in the recipient is considered ≥ than that of blood from other involved donors**

Case Classification

- **Confirmed**
  - **Confirmatory laboratory results and at least one of the objective or subjective clinical evidence criteria**
- **Probable**
  - **Supportive laboratory results and meets at least one of the objective clinical evidence criteria**
  - **Blood donor or recipient epi-linked to a confirmed or probable babesiosis case and**
    - **has confirmed lab evidence but lacks any of the clinical criteria; OR**
    - **has supportive lab evidence but lacks objective clinical criteria**

Case Classification

- **Suspect:**
  - **Confirmatory or supportive laboratory results, but insufficient clinical or epidemiologic information is available for case classification**
    - **(e.g., only a laboratory report was provided)**

Summary

- **Babesiosis is a tick-borne disease, shares Lyme disease tick vector**
  - **Newly reportable in 2011**
- **Transfusion-associated cases are possible**
- **Case investigation and ascertainment help is available from zoonoses team**